

FINAL REPORT

of the

**Commission to Study Ways to Encourage Proper
Recycling and Disposal of Grease Trap Wastes and to
Develop Additional Disposal Capacity**

HB 1373, Chapter 261, Laws of 2006

Committee Members

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November 1, 2007

Executive Summary

Commission Established

In 2006 the New Hampshire Legislature passed HB 1373 which established this Commission “to study ways to encourage the proper recycling and disposal of grease trap wastes and to determine ways to develop additional disposal capacity.” The Commission was charged with studying:

- I. Ways to ensure the proper recycling and disposal of grease trap wastes.
- II. Systems for managing grease trap wastes currently used in the United States and Canada.
- III. The status of the in-state and regional markets available for handling grease trap wastes and methods for future development of in-state disposal capacity.
- IV. The ability of the Department of Environmental Services to assist municipalities in regard to rules, regulations, penalties, and best management practices for grease trap sizes, cleaning cycles, standards, and pumping.

Existing Situation

Municipally-owned wastewater treatment facilities throughout the United States are detrimentally impacted by Fats, Oil and Grease (FOG) (Hamkins, 2006). FOG is introduced primarily from food service establishments that prepare and serve large volumes of food; additional FOG can also originate from individual homes. Once in the sewer systems the FOG can clog sewer lines as it solidifies and coats the pipes, and this coating can get as hard as concrete (Tucker 2006). Over time sewer pipe flows can be restricted and the lines can even seal completely. The restricted flow can cause the sewer system to back up, resulting in a sanitary sewer overflow (SSO), where sewer water flows out of a manhole cover and along the ground. These overflows can then contaminate the ground, local water bodies and any property that the sewerage comes into contact with.

The improper management of FOG is not only a hazard to the environment and potentially the public’s health, it also results in added financial burdens to both food service establishments and wastewater treatment plants. Lines clogged with FOG deposits require cleaning by the food establishment when it involves business owned pipes and by the wastewater treatment plant operator for sewer system pipes. Operations at treatment plants can also be negatively impacted.

Fortunately, there are effective methods that can be employed at food service establishments to prevent significant amounts of FOG from flowing through and clogging the disposal pipes. These methods involve the capture of the FOG, to be then disposed of or possibly recycled through some alternative means. Wastewater treatment plants have the authority, through the adoption of local ordinances, of requiring businesses to practice these methods of FOG discharge control.

This report contains study information from the Commission that identifies and describes the problem, outlines the tools available for FOG management, and examines the current disposal outlets available to New Hampshire. In addition, the Commission makes the

following recommendations that should help in bringing about better FOG management in the state.

Recommendations

1. **Best Management Practices.** It is important that wastewater treatment operators and food service establishment owners and managers have access to written Best Management Practices (BMPs) aimed at reducing FOG discharges to sewer systems at food service establishments. The Department of Environmental Services (DES) should formalize its draft BMP document (see Attachment A), after proper public input, and distribute it to wastewater treatment operators and make it readily available to food service establishment owners.
2. **Technical Assistance and Training.** The DES should provide technical assistance and training to municipalities that are interested in developing a grease trap waste control program in their communities.
3. **Education.** The DES should work with health officers, restaurant inspectors, and treatment plant operators to educate them about grease traps.
4. **Disposal Capacity.** The DES should encourage the development of grease disposal capacity, including the beneficial reuse of the material as a fuel source.
5. **Research.** Legislation should be filed in the 2008 session to provide funding to DES's Winnepesaukee River Basin Program to study its ability to treat grease in order to make electricity through a digester and /or to manufacture biodiesel. The electricity or biodiesel could be used by the state or the local (member) communities to reduce energy costs. The approximate cost of the study is \$100,000.
6. **Incentives Program.** An incentive program should be developed to encourage restaurants to maintain their grease traps on a routine basis. One incentive could be a sticker or green logo to let patrons know that a restaurant is being environmentally responsible with its grease management.

What is FOG?

FOG is commonly derived from food products such as deep-fried foods, meats, sauces, gravy, dressings, baked goods, cheeses, and butter (City of Seal Beach, 2004, p. 9). Food-derived FOG can end up going down the drain and ultimately into the sewer system during the cleaning of plates, pots and pans to remove food residue or by improper disposal of leftovers or grease. Once inside the sewer FOG can form a thick layer "constricting flow, similar to the way cholesterol affects blood flow in our arteries" (SFWPPP 2004, p. 2). This coating can block sewage from traveling through the sewer pipe.

The Problem

Problems can occur when sewer pipes are restricted or blocked. Sewers can back up causing overflows in which untreated sewage can enter homes, businesses, or even flow into surface waters. This causes environmental and public health concerns since the

overflow can attract flies and vermin and cause odor problems (SFWPPP 2004, p. 2). Untreated sewage can contain “bacteria like *E. Coli*, viruses, helminthes (intestinal worms), and parasites” (Whitman, 2000). The EPA estimates that “more than a million Americans become ill each year just from sanitary-sewer overflows” (Whitman, 2000). Sewer overflows can also contaminate surface waters, causing low levels of dissolved oxygen and algae blooms, both of which can kill aquatic life.

In the United States, sewers back up annually “an estimated 400,000 times, and municipal sewer overflows on 40,000 occasions” (Whitman, 2000). The EPA has determined that sewer pipe blockages are the leading cause of sewer overflows, and grease is the primary cause of sewer blockages, see Figure #1 and Figure #2 (EPA 2004, p. 4-28).

Figure #1 - Causes of Sewer Overflows

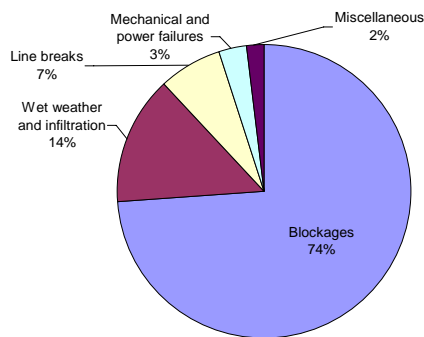
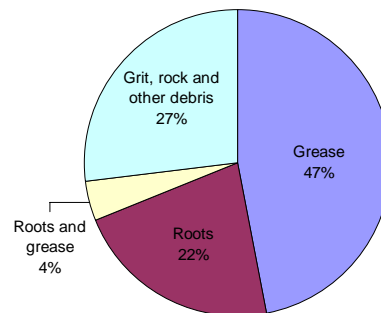


Figure #2 – Causes of Sewer Blockages



Source: EPA, 2004, p. 4-28

Overflows and backups can be expensive. The “costs can vary from \$5,000 to more than \$100,000” per incident (Mero & Wilkerson, 2007). These expenses can be placed upon homeowners, businesses and municipalities, as illustrated by the following examples.

- *Cost to Homeowners* - In Fort Worth, TX, three homes were flooded by a sewer backup mainly caused by household grease buildup in the pipe. One home had an estimated \$13,055 in damage. The City was reported to have immunity from property damage caused by sewer main blockages (Jinkins, 2005). Another grease clog near an apartment complex in Roanoke, VA left the residents of seven apartment buildings with flooded apartments (Tisdale, 2006). These residents were displaced during the clean-up and personal property was destroyed.
- *Cost to Businesses* - Businesses can experience similar damage to those of homeowners. In Grover Beach, CA a clog triggered flooding of three businesses, causing damage in the thousands of dollars (Neff, 2004). FOG clogging has also caused entire malls to be temporarily closed (Yates, 2002) and tourist areas to close in the Faneuil Hall area in Boston, where a 300 foot grease clog obstructed a 36 inch diameter sewer line (Russell, 2002). These businesses experienced both

thousands of dollars in property damage and lost sales revenue while the sewage overflows were cleaned up.

Restaurants are often cited as the major source of FOG. These are also the most likely to incur damage and lost revenue due to damaged property, lost customers and spoiled food. In addition blocked kitchen drains caused by fats, grease and oil can mean expensive service calls (Gledhill, 2004; WASTE DISPOSAL 2004). Restaurants that cause sewer backups can also face fines from the local sewer authority or even be shut down until problems are corrected (Marshutz, 2002; Newman, 2001; Youker, 2005).

- *Cost to Municipalities* - Municipal sewer systems incur the highest costs from FOG damage, estimated at \$25 billion per year nationally (Russell, 2002). These costs are for preventive maintenance, unclogging sewer pipes, repairing sewer lines, and administration. Costs are passed on to rate payers. It has been reported that “75% of the U.S. sewer systems working at half capacity due to grease clogs” (Dougherty & Parker, 2004; Newman, 2001; Russell, 2002). Most sewer system operators try to maintain the system to avoid overflows and backups; for example, routine line cleanings and sewer pipe inspections minimize the chances of sewer overflows.

When overflows do occur the municipality can be required to pay the cost of damaged property or cleaning up a sewage backup. For example, in Charlotte, NC on April 6, 2007, the City was trying to clear a grease clog out of the sewer line and about 3,000 gallons of sewage backed up into a nearby home. The City was responsible for the gutting, repair, and cleanup of the house as well as supplying housing for the residents while the house was uninhabitable, at a total cost estimated at \$101,300 (Lacour, 2006).

The Environmental Protection Agency (EPA) “expects its state environmental counterparts, and in turn the local governmental jurisdictions, to comply with the ‘anti-grease’ efforts” (Dougherty & Parker, 2004). When the EPA determines that sewer maintenance is lacking or that anti-grease efforts are insufficient, and a spill or sewer overflow occurs, the local municipality can also be subject to fines, penalties or lawsuits.

Federal fines have been levied against many jurisdictions for sewer backups caused by FOG. For example, Cobb County, GA was fined \$70,000 when 600,000 gallons of sewage spilled into the Chattahoochee River (Montgomery, 2004). The City of Los Angeles, CA, incurred fines of up to \$8 million (APEC, 2007) when the EPA determined that 41% of the city’s 2,000 sewer overflows in Los Angeles were caused by kitchen grease (Montgomery, 2004; Newman, 2001; Truini, 2004); the City was also required to spend \$2 billion to upgrade its sewer system as part of a settlement brought against them by the EPA and other community groups (Truini, 2004).

New Hampshire wastewater systems, just like any others, can be impacted by FOG. One small New Hampshire City had 30 overflows between 2000 and 2005, many of which contaminated local waterways. The EPA fined this community \$58,000 for these occurrences and has required the city to develop and implement a plan to remove structural deficiencies in their wastewater treatment infrastructure.

All sewer overflows must be reported to the New Hampshire Department of Environmental Services under general NPDES permit requirements. Based on DES records, for the period from 1998 to 2006, there were 687 sewer overflows reported. Most of the overflow reports did not state the specific cause of the overflow, so a calculation of grease-caused overflows in NH is not available.

Even if accumulated FOG does not escalate into blockages and sanitary sewer overflows, it can disrupt wastewater utility operations and increase operations and maintenance requirements” (Mero & Wilkerson, 2007). These are all costs that can be reduced through a pro-active FOG control program.

The Solution

Successful programs that control grease have been developed. These all involve the implementation of grease separation technologies to separate grease from the wastewater to prevent or minimize the discharge of grease to sewers. The programs also always include a management system to ensure that the grease traps are maintained on a regular basis and function properly.

Technology

Technologies to prevent grease from entering a sewer system have been around since 1884 when Nathaniel Whiting was issued a patent for grease trap technology. The basic technology has remained virtually unchanged since that time (PDI-G 101, 2007 p. 2; Yates, 2002). There are two basic technologies for grease separation: grease traps (Figure #3) and grease interceptors (Figure #4).

Figure #3 - Grease Trap

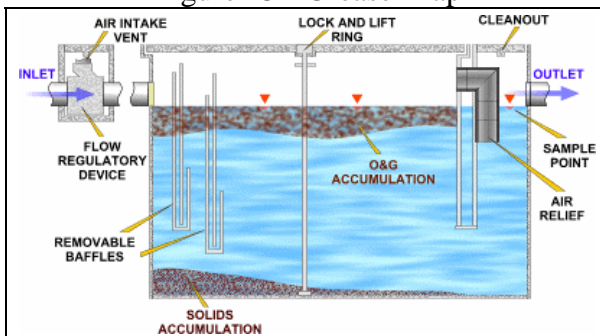
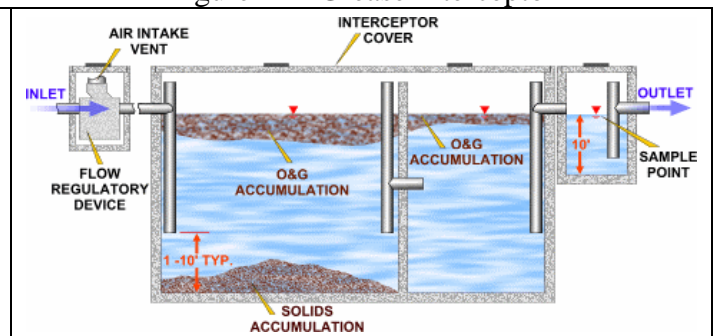


Figure #4 - Grease Interceptor



Source: ORACWA, 2007, p. 42 & 44

“The purpose of grease traps and grease interceptors is to allow separation of solids and grease, to contain them in an on-site holding facility, and to prevent these troublesome

wastes from entering the main sewer system or septic/drain field” (*EBI, n.d.*). These units operate by using time, temperature and a regulation of flows. Grease traps and interceptors are most frequently used at food service establishments, such as restaurants and cafeterias. Other applications include large apartment buildings and grocery stores, where large amounts of food are prepared or served.

The terms “grease trap” and “grease interceptor” are often used interchangeably; however, there are distinct differences between the two.

Grease Traps

Grease traps are usually found installed inside buildings and typically have capacity limited to about 55 gallons (Engle, 2006). They are usually installed close to the location where grease is generated. All grease traps have baffles in their reservoir to retain the “wastewater long enough for the grease to congeal and rise to the surface” (*ORACWA, 2007, p. 6*). Grease from the traps can easily be removed and disposed of properly. Most units have removable covers that allow for the cleaning; however, some newer units have automatic skimmers that will remove the grease from the surface by skimming the grease and moving it to another container.

Grease Interceptors

Grease interceptors are usually installed in large vaults with a minimum capacity of 750 gallons (Engle, 2006). These vaults have at least two compartments in series that provide for flow from the first to the second compartment through a 90-degree fitting designed for grease retention. These units provides a long residence time to allow the wastewater time to cool to further assist in grease separation from the wastewater. Grease will congeal and rise to the surface where it accumulates until the interceptor is pumped clean. (*ORACWA, 2007, p. 6*).

Automated Systems

Automated systems of grease collection have also been developed. These systems are similar in design to passive grease traps, except that the device automatically conveys the grease from the inside of the unit, where it has been trapped, to a container on the outside. The grease can then be easily disposed of or recycled. This type of system is much easier to maintain as the trap does not need to be opened to clean out the grease, which is an unpleasant job and creates a foul smell in the kitchen and the eating establish in general. The cleaning of passive grease traps are often neglected for these reasons. As a result, automated systems turn out to be more effective in preventing grease from entering the sewer, thereby avoiding costly cleanings of private and public sewer lines and the prospect of sewer overflows from clogged pipes. However, these systems are more expensive to install.

Regulatory Framework

New Hampshire has all the necessary regulatory authority to establish an effective grease trap collection program. Grease traps are required to be installed and maintained both by

state statutes and rules as well as local sewer use ordinances and health/building regulations.

State Plumbing Codes

The New Hampshire Building Code (RSA 155-A) includes by adoption by reference (RSA 155-A:1, IV) the International Plumbing Code 2006 as the definitive source for determining the installation of all plumbing fixtures, pipes and related devices. Chapter 10 of the International Plumbing Code (IPC) contains the standards for grease traps, interceptors and separators. These requirements are enforceable by the New Hampshire Plumbing Board.

The IPC states that “grease traps and grease interceptors shall be required to receive the drainage from fixtures and equipment with grease-laden waste located in food preparation areas, such as in restaurants, hotel kitchens, hospitals, school kitchens, bars, factory cafeterias, or restaurants and clubs” (IPC, 2000, p. 74). This portion of the code requires virtually all food service establishments in the state to have an operational grease trap or grease interceptor. Furthermore, the code specifies the capacity of the required grease trap or interceptor based upon the total flow-through rate (Table 1).

Table #1
CAPACITY OF GREASE TRAPS

Total Flow-Through Rating (gpm)	Grease Retention Capacity (pounds)
4	8
6	12
7	14
9	18
10	20
12	24
14	28
15	30
18	36
20	40
25	50
35	70
50	100

For SI: 1 gallon per minute = 3.785 L/m, 1 pound = 0.454 kg

All grease traps must also conform to the Plumbing and Drainage Institute (PDI) Standard G101 (IPC 2000, p. 74). This applies to Type I Hydro Mechanical Grease Interceptors which include interceptors such as those normally installed inside buildings. These devices are compact in size and the grease separation occurs quickly, in about one minute. This fast separation is attributed to “several simultaneous actions; a hydraulic flow action, air entrainment and the difference in specific gravity between water and FOG” (PDI-G 101 2007, p. 2).

Plumbing and Drainage Institute Standard G101 establishes the detailed requirements for grease traps, including criteria to properly size the traps, installer requirements, and management requirements. PDI has an independent laboratory that tests grease

interceptors to determine compliance with PDI-G101 standards and issues a seal as evidence that the product has met the specified requirements of the Institute's Standards (PDI 2007).

Section A2.2 of the PDI G101 standard requires that all indoor grease traps be cleaned regularly. "The frequency of grease removal is dependent upon the capacity of the interceptor and the quantity of grease in the waste water. Grease removal intervals may therefore vary from once a week to once in several weeks. When the grease removal interval has been determined for a specific installation, regular cleaning at that interval is necessary to maintain the rated efficiency of the interceptor" (PDI-G 101 2007, p. 19).

Until recently, violating the PDI grease trap cleaning requirement was a misdemeanor in the State of New Hampshire. However, the penalty for code violations which would include the requirement to clean grease traps was removed by the NH Legislature in 2006, with the passage of SB 359.

Environmental Regulations

In addition to the New Hampshire Plumbing Board requirements, all grease traps and interceptors are subject to administrative rules adopted by the Department of Environmental Services. The appropriate rules are determined by the wastewater disposal method of the establishment. For discharges of wastewater to a septic tank the Subsurface rules (Env-Ws 1000) are applicable, while establishments that discharge to a municipal sewer are governed by pretreatment standards (Env-Ws 904).

Subsurface System Rules (Env-Ws 1000)

For food service establishments served on site by subsurface wastewater disposal systems (septic systems) the Department of Environmental Services has statutory authority in RSA 485-A:29 to adopt rules that "*... shall specify ... what tests are to be required, what standards, guidelines, procedures, and criteria are to be applied and followed in constructing any sewage or waste disposal system, and other related matters. The rules shall also establish the methodology and review process for approval of innovative/alternative wastewater treatment systems and for approval of a plan for operation, maintenance, and financial responsibility for such operations.*" These rules have been codified in Env-Ws 1000 Subdivision and Individual Sewage Disposal System Design Rules.

The Env-Ws 1000 regulations require all food service establishments to have grease traps (Env-Ws 1012). In addition, New Hampshire state law (RSA 485-A:43, IV) requires these systems to be operated and maintained in a manner "*to prevent a nuisance or potential health hazard due to failure of the system. Failure to so operate and maintain shall be considered a violation of this chapter and shall be subject to the penalty as provided in RSA 485-A:43, IV.*" Despite these requirements, there is no statutory or codified authority to verify proper operation of a sub-surface system.

Wastewater Rules (Env-Ws 900)

Food service establishments that are served by municipal sewers are primarily regulated by the municipality or political subdivisions under local sewer use ordinances. These facilities receive authority from the state under RSA 149-I:6. These programs are approved and overseen by the Department of Environmental Services Industrial Pretreatment Program.

New Hampshire state law provides statutory authority, in RSA 485-A:4, XV, for the Department of Environmental Services to regulate local pretreatment programs. These programs are designed to keep substances that would interfere with the operation of the wastewater treatment plant and sewers out of the wastewater stream. Pretreatment programs are regulated by DES under Env-Ws 904 Standards for Pretreatment of Industrial Wastewater.

RSA 485-A:4, XV To "establish and prescribe physical, chemical and biological pretreatment standards to which waste must conform before discharge into the collection system or the sewage treatment facility of a municipality or other governmental entity being served by or under order to construct a public sewage treatment facility".

Local Regulatory Framework

A Municipal Sewer Use Ordinance is required by the Department of Environmental Services through state regulation Env-Ws 904 Standards for Pretreatment of Industrial Wastewater. A local sewer use ordinance may contain details of how the local authorities will regulate sources of grease in their collection system.

It is important to note that the Department of Environmental Services has authority in RSA 485-A:5, IV to enforce any limits set in the sewer use ordinance and require ordinance implementation by sewer authorities.

Grease Generation

Both grease traps and interceptors need to be cleaned on a routine basis, which results in a substantial amount of grease to be disposed of. The exact quantity of grease being disposed of annually in New Hampshire is unknown; however, reasonable estimates can be developed using available publications and surveying grease disposal locations. We can use some simple formulas to determine the estimated quantities of grease that could be in the system and we can survey disposal locations to see how much grease is being disposed of.

Grease Generation Estimates

The *Urban Waste Grease Resource Assessment* published by the US Department of Energy: National Renewable Energy Laboratory, provides a comprehensive study of

grease generation at 30 metropolitan sites throughout the United States and provides a detailed estimate of grease generation.

According to this report, the “combined resources of collected grease trap waste and uncollected grease entering the sewage treatment plants ranged from about 2 to 27 pounds/person/year” and the weighted average is about 13 pounds of grease/person/year (Wiltsee, 1998). Applying the weighted average to NH population (1,314,895 persons) yields 18 million pounds or over 2 million gallons of grease generated in New Hampshire each year. The data range suggests that the grease generation can range from a low of 315,000 to a high of over 4.2 million gallons. Figure 1 shows the Estimated Grease Generation in NH using the weighted average provided by the *Urban Waste Grease Resource Assessment*.

Figure 1 - Estimated Grease Generation in NH		
2006 NH Population 1,314,895 x 13.37 pounds of grease/person/year = 18,014,061 pounds/year		
Convert to Gallons		
18,014,061 Pounds of grease/year ÷ 8.34 pounds/gallon = 2,159,959 gallons/year		

The estimated 2.1 million gallons per year is probably a conservatively low figure because New Hampshire annually serves a large tourist population that increases the actual grease generation rates. This could be especially true when we consider that tourists may rely on eating out more than an average resident.

Grease Disposal Estimates

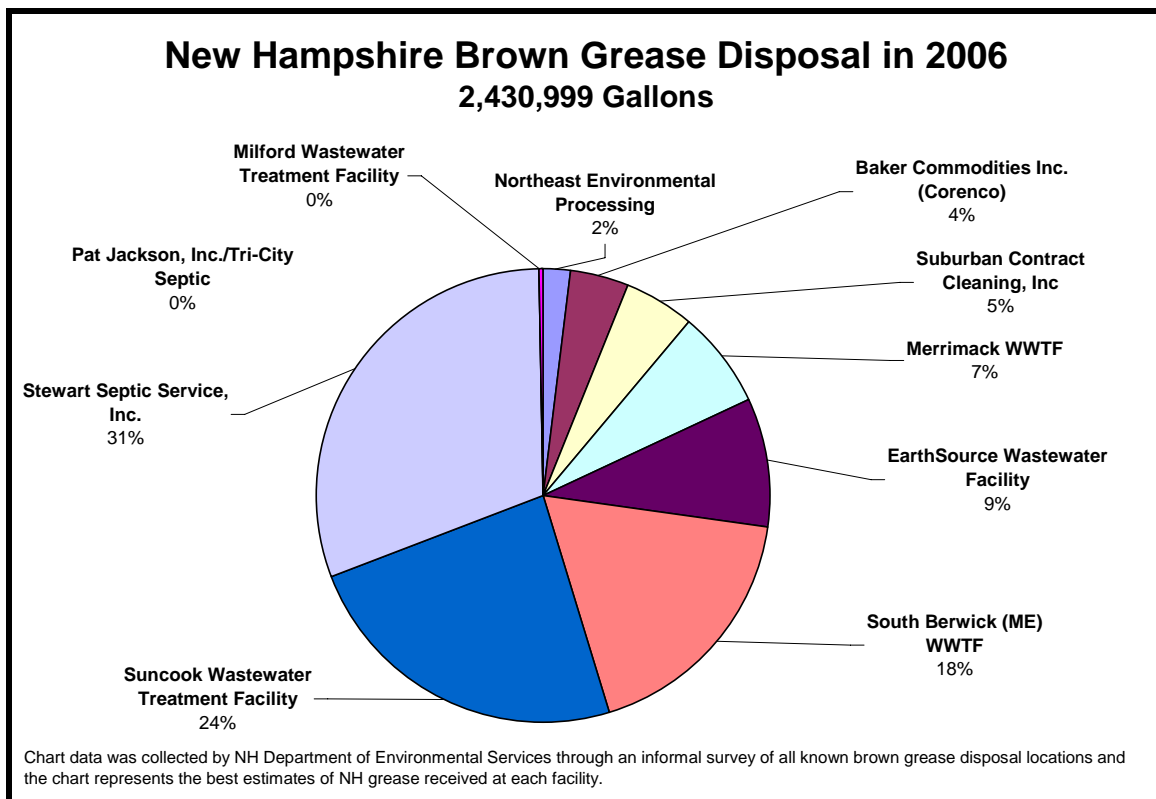
Data for grease disposal in New Hampshire is not readily available. Therefore, to estimate grease disposal in New Hampshire, all known disposal outlets were contacted through a phone survey in the summer of 2007. The survey results are presented in Table #1. Appendix A contains additional data and contact information used to perform this survey.

Table #1 - NH Grease Disposal in 2006

Disposal Location		Quantity (Gallons)
Baker Commodities Inc. (Corenco)	Billerica, MA	100,000
EarthSource Wastewater Facility	Raynham, MA	225,000
Merrimack WWTF	Merrimack, NH	166,422
Milford Wastewater Treatment Facility	Milford, NH	6,000
Northeast Environmental Processing	Lawrence, MA	47,460
Pat Jackson, Inc./Tri-City Septic	Augusta, ME	10,000
Suburban Contract Cleaning, Inc	Rochester, MA	125,000
South Berwick (ME) WWTF	South Berwick, ME	439,067
Stewart Septic Service, Inc.	Bradford, MA	745,900
Suncook Wastewater Treatment Facility	Allenstown, NH	582,150
Total:		2,446,999

In 2006, grease generated in New Hampshire went to 10 disposal locations throughout the region. Only three disposal outlets are located within New Hampshire: the Suncook Wastewater Treatment Facility (the largest NH location), the Milford Wastewater Treatment Facility and the Merrimack Wastewater Treatment Facility. Both the Merrimack and Milford facilities only receive waste from their limited service area. The remaining grease disposal outlets do not have restrictions on their service area and will take grease from any NH municipality.

All of the private disposal facilities appear to have additional disposal capacity, although no estimates were given. They were also interested in the New Hampshire market.



Conclusion

Grease management in New Hampshire is primarily dependent on local authorities for implementation and enforcement. The necessary technology and regulatory structure exists to create an effective FOG management program in New Hampshire. The Department of Environmental Services is in a position to offer technical assistance to local or regional officials, wastewater operators, restaurant owners and health inspectors regarding proper FOG controls. As more restaurants properly maintain their grease traps, we should see sewer overflows decrease.

The Commission recognized from the outset that the frequent present practice of disposing of brown grease through landfilling represents both a waste of the energy potential thereof and a further reduction of NH landfill capacity. Indeed, this recognition

provided the genesis for the study commission. Thus, the commission sought information on new developments, pilot projects and/or experimental work toward energy recovery from brown grease. Various current experimental efforts came to the commission's attention, but none that demonstrated both technical and financial viability at this time. The current situation is exacerbated by the announced intention of the state of Maine to close the S. Berwick, ME facility to NH haulers, among others, as well as by abutter complaints about odor problems at that location and others. It is believed that brown grease represents a significant contributing factor to odor problems; and its removal from the waste stream and conversion to an energy source, however minor in the greater scheme of things, would clearly be a step in the right direction.

In the course of its work, the Commission was made aware of an innovative and proprietary process developed by Batchelder Biodiesel Refineries (BBR). Mr. Lee Batchelder, BBR principal engineer, and Prof. Melinda Treadwell of Keene State College made a presentation to the Commission about this endeavor. Although the Commission takes no official position recommending or endorsing the BBR process, there seems to be credible evidence that the technology, and the business plan, offer the prospect of diverting a substantial amount of trap waste from landfill disposal in NH, and of generating ASTM certified B100 instead. Representations to the Commission by BBR project as much as 240,000 gallons of B100 to be produced in the first year. At the indicated conversion rate, this would result in the removal from the waste stream of as much as 480,000 gallons of brown grease per annum.

Current science indicates that a five percent admixture of B100 to heating oil, i.e. B5, and a twenty percent admixture to automotive diesel, i.e. B20, can result in very significant particulate matter reductions in both heating and automotive uses.

Thus, it seems clear that the diversion of trap waste to be converted to B100 promises multiple gains: reduction of landfill volume, possible savings to brown grease generators and haulers, in-state production of a valuable fuel and environmental benefits from reductions in atmospheric particulate matter. Since the Commission's charge is to study ways to encourage proper disposal and recycling of grease trap wastes and to determine ways to develop additional disposal capacity, the benefits described above seem tailor made.

Appendix A

Companies Accepting Grease Trap Waste from New Hampshire

Listed Companies Accepting Grease Trap Waste from New Hampshire	
<p>Baker Commodities Inc. (Corenco) North Billerica, Massachusetts Ken Fournier, Sales Rep. Tel: (978) 454-8811/Ext. 215)</p> <p>2006 Total: 100,000 gallons</p>	<p>Milford Wastewater Treatment Facility Nashua Street, Milford NH 03055 David Boucher, Lab Supervisor Tel: (603) 249-0662 \$0.75/Gal Milford and Wilton Grease Only</p> <p>2006 Total: 6,000 gallons</p>
<p>EarthSource Wastewater Facility 1958 Broadway Raynham, MA 02767 Bob Kelly /Guy Campinha Tel. (508) 823-2111 \$0.15/Gal</p> <p>2006 Total: 225,000 gallons</p>	<p>Northeast Environmental Processing 28 Water St., Lawrence, MA 01840 (Plant) Tel: (800) 794-9265 \$0.15/Gal</p> <p>2006 Total: 47,460 gallons</p>
<p>Pat Jackson, Inc./Tri-City Septic 32 Stoney Brook Road Augusta, ME 04330 Tel. (207) 623-3223 \$200/1000 Gal minimum charge</p> <p>2006 Total: 10,000 gallons</p>	<p>Suburban Contract Cleaning, Inc 55 Messina Drive Braintree MA Tel: (781) 356-4400</p> <p>SEMASS Rochester, MA 2006 Total: 125,000 gallons</p>
<p>Stewart Septic Service, Inc. 20 S. Mill St. Bradford, MA 01835 John Divincenzo Tel: (978) 372-7471 \$0.20/Gal - \$0.30/Gal or less for routine business.</p> <p>2006 Total: 745,900 Gallons</p>	<p>South Berwick (ME) WWTF 180 Main St South Berwick, ME 03908 Skip Clough (207) 384-0091 \$0.14/Gal</p> <p>2006 Total: 439,067 Gallons</p>
<p>Public Works - Wastewater Division Merrimack WWTF 36 Mast Rd. Merrimack, NH 03054 James Taylor, Assistant Director of Public \$0.05/ Gal Merrimack Grease only</p> <p>2006 Total: 166,422 gallons</p>	<p>Suncook Wastewater Treatment Facility 36 Canal Street Allentown, NH 03275 Dana Clement, Superintendent Tel: (603) 485-2027 \$0.15/Gal</p> <p>2006 Total: 582,150 gallons</p>

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Attachment A

Fats, Oil, and Grease
Best Management Practices
for Publicly-Owned Treatment Plants and
the Food Service Industry of New Hampshire

DRAFT

Compiled by the
NH Department of Environmental Services



Acknowledgments: This manual was compiled by the NH Department of Environmental Services and reviewed by the NH Fats, Oils and Grease (FOG) Study Commission. Some information contained herein was reproduced from other governmental agencies, including the Oregon Association of Clean Water Agencies, the California Fats, Oils, and Grease Work Group and the Lexington-Fayette Urban County Government.

Purpose: This manual is intended to be used by NH wastewater treatment facilities and food service establishments that wish to manage FOG sources in their communities.

Disclaimer: The Best Management Practices presented in this manual are meant to serve as guidance in managing FOG; however, individual ordinances, laws and regulations may vary by community.

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Introduction

Fats, oil and grease, also referred to as FOG, can have negative impacts on wastewater collection and treatment systems. Most wastewater collection system blockages can be traced to FOG as the cause. Blockages in the wastewater collection system are serious, causing sewage spills, manhole overflows, or sewage backups in homes and businesses, which can place public health and the environment at risk.

Two types of FOG pollutants are common to wastewater systems. Petroleum-based oil and grease (non-polar concentrations) are typically found at businesses using oil and grease, and can usually be identified and regulated by municipalities through local limits and associated pretreatment permit conditions. Animal and vegetable-based oil and grease (polar concentrations) are more difficult to regulate due to the large number of restaurants and fast-food outlets in every community.

This Best Management Practices (BMP) manual is written to provide municipal pretreatment staff, along with food service establishment owners/managers with information about animal and vegetable-based oil and grease pollution prevention techniques. The guidance provided in this manual is effective in both reducing maintenance costs for business owners, and preventing oil and grease discharges to the sewer system.

Ensuring that grease traps and grease interceptors are properly installed, and most importantly, properly maintained is relatively easy. This manual focuses on proper maintenance of grease traps and interceptors, and includes inspection checklists for municipal pretreatment inspectors. Knowledgeable municipal pretreatment staff from the wastewater treatment plant, working with business owners, can effectively prevent oil and grease buildup, and the associated problems.

Characterizing FOG Sources

It is important for each wastewater treatment facility (WWTF) to fully understand the sources of FOG entering their collection system, prior to developing a control program. The WWTF must determine the location of collection system “hot spots” (areas within the collection system that require frequent maintenance), how the hot spots are related to FOG discharges, and where the FOG originates. Since FOG blockages are a “middle-of-the-pipe” problem, it is necessary to evaluate ongoing collection system maintenance, as well as all potential sources of blockages, to provide a complete and accurate picture of what is contributing to sanitary sewer overflows. This information allows a WWTF to determine where its resources should be focused to effectively control FOG discharges and reduce overflows and operational problems in a cost effective manner. Historical records of collection system maintenance activities should be reviewed to ascertain any useful information on the causes of sanitary sewer overflows and locations of any FOG-related hotspots.

A system for reviewing these records is outlined below:

- Identify any particular problem sites within the collection system based on sanitary sewer overflows, extent of cleaning frequency, odor reports, and any other type of citizen complaints.
- Review collection system operator’s notes, especially on the type of materials being removed during cleaning. (If this type of information is not being recorded, institute a standardized policy for data collection based on the following two action items.)
- Introduce standardized forms (cleaning and repair) for recording specific information during maintenance work.
- Distribute log books to keep with the maintenance/inspection vehicles for recording information during drive-by inspections.
- Compile the information and categorize the hot spots by the cause of the operational problems (e.g., roots, FOG, structural issues).
- Produce collection system maps that show the spatial relationships between the hot spots and particular areas of the municipality (e.g., high density or single family residential areas, business districts, and restaurant districts). Many WWTFs use Geographic Information Systems (GIS) for mapping and data management that can be frequently updated and contain land use information.
- Rate the severity of each hotspot on the map and use this information to determine correlations between upstream use and FOG-related hotspots.
- Characterize the sources of FOG at each FOG-related hotspot.

Depending on the source(s) of FOG, program resources should be allocated accordingly. For example, if FOG is accumulating downstream of a residential area, resources should be directed towards public education. However, if FOG problems are occurring downstream of restaurants and business districts, program resources should be allocated towards educating food service establishments.

Best Management Practices for Food Service Establishments (FSE)

Fats, oil and grease can be managed effectively in the food service industry to minimize the discharge to the sewer system and decrease the required maintenance of grease interceptors. By preventing the introduction of grease into the wastewater treatment system you reduce the burden on the grease interceptor and thus reduce maintenance time, costs and disposal fees. The Best Management Practices offered here are techniques used throughout the industry, and have proven effective when implemented properly and consistently.

Train Kitchen Staff:

Train kitchen staff in management practices and methods to reduce the volume of grease discharged to the sanitary sewer system. Train them to be aware of problems created by grease in the sewers system, possible violations and fines and the cost of cleaning clogged pipes. Even a small amount of grease on each pot, pan or plate can be substantial when you serve hundreds of meals per day.

Post "NO GREASE" Signs:

By posting "No Grease" signs above sinks, on dishwashers and near other grease discharge points, it serves as a constant reminder to keep grease out of the system.

Dry Wipe Pots, Pans and Dishware Prior to Dishwashing:

Food, fats, cooking oil and grease remaining in pots and pans should be dry wiped or scraped out into the trash prior to wet washing. In some establishments this can substantially reduce Fat's Oil and Grease (FOG) discharged to your grease interceptors. Disposing of grease by recycling or garbage is less expensive than pumping out and hauling away FOG from a grease interceptor.

Do Not Dispose of Waste Food Through a Garbage Disposal:

Ground up food scrapes will settle in the grease interceptor and take up valuable space. This will lower the detention time in the grease interceptor and result in reduced efficiency. Instead, recycle or dispose food scraps as a solid waste. This will also help reduce the frequency of grease interceptor cleanings.

Clean Grease Interceptor Routinely and Keep Records:

Routine cleanings and inspections will ensure proper operation of the interceptor. Make note of the grease level and record it in maintenance log (see Appendix D). If the grease level is at its maximum, the cleaning frequency should be increased. Conversely, if best management practices are being implemented effectively and the grease in the unit is minimal, then the cleaning frequency may be reduced. Grease interceptors that are not cleaned regularly can produce very unpleasant odors.

Witness Cleaning and Maintenance Events:

The on duty manager should witness all cleaning events to ensure they are performed completely and properly. This will ensure that pumpers/haulers do not take any shortcuts. To properly clean the interceptor the entire contents must be removed, including grease cap (floating grease) and sludge pocket (settled solids). Failure to remove the slug pocket (settled solids) in the bottom will result in lowered total capacity and reduced detention time. The manager should also be sure removable baffles are replaced after cleaning.

Inspect the Grease Interceptor During Maintenance:

The design of most grease interceptors is very simple, but each part serves an essential function. The baffles must be in place and properly positioned to be effective. Covers must fit properly so they do not leak. In-ground interceptors should be examined for cracks, which could allow wastewater to leak out or ground water to leak in.

Bacteria and Enzymes May Help:

Some facilities have used bacteria and or bacterial enzymes to reduce the cleaning frequency of their interceptors. These bacteria are specifically selected for their ability to break down fats, oils and grease. Facilities have had varying levels of success. The Department of Environmental Services cannot confirm the effectiveness of this method.

Prohibitions Relating to Discharge of Fats, Oil, and Grease

DO NOT...	REASONS WHY...
Do not discharge fats, oil, and grease in concentrations that will cause an obstruction to the flow in a sewer, or pass through or interference at a wastewater treatment facility.	Grease can solidify and trap other solid particles to completely plug the wastewater collection system.
Do not discharge grease, improperly shredded garbage, animal guts or tissues, paunch manure, bones, hide, hair, fleshings, or entrails.	These materials in combination or alone can cause blockages and other operations and maintenance problems in the wastewater collection and treatment system.
Do not discharge wastewater with temperatures in excess of 140° F to any grease traps. This includes water from mechanical dishwashers that have a minimum required temperature of 160° F.	Temperatures in excess of 140° F will dissolve grease, but the grease can re-congeal and cause blockages further downstream in the sanitary sewer collection system as the water cools.
	Note: High temperature water, such as from a dishwasher, is discharged to the remotely-located grease interceptor, if there is one. The remote location and the high volume of the interceptor allows the water time to cool so that there is not a problem with dissolving grease and moving it further downstream. The high volume also provides dilution of the detergents in the dishwasher waste.
Do not discharge waste from a food waste disposal unit to any grease traps.	The food waste will greatly reduce the capacity of the grease trap for retaining grease and can cause worse problems with blockages.
Do not discharge caustics, acids, solvents, or other emulsifying agents.	Though emulsifying agents can dissolve solidified grease, the grease can re-congeal further downstream in the sanitary sewer collection system.
	Caustics, acids, and solvents can have other harmful effects on the wastewater treatment system and can be a hazard to employees working in the wastewater collection system.
Do not discharge fats, wax, grease or oils containing substances that will become viscous between 32° F (0° C) and 150° F (65° C).	The temperatures shown are temperatures that can occur in the wastewater collection and treatment system. If these substances congeal, solidify, or become too viscous, they can cause blockages and other operations and maintenance problems.
Do not utilize biological agents for grease remediation without permission from the sanitary agency receiving the waste.	The biological agents may disrupt the biological treatment process at the wastewater treatment plant.
Do not clean equipment outdoors in an area where water can flow to the gutter, storm drain, or street.	Grease and dirt will be washed off the equipment and enter the storm drain system and flow to nearby streams.

Grease Trap and Interceptor Maintenance

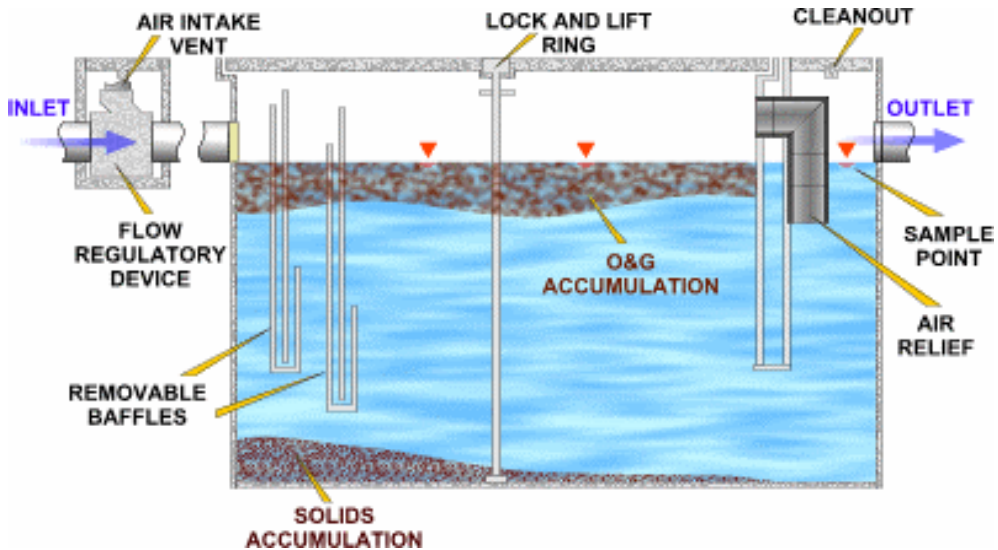
Grease trap maintenance is usually performed by maintenance staff, or other employees of the establishment. Grease interceptor (GI) maintenance, which is usually performed by permitted haulers or recyclers (see Appendix A for *Fats, Oil and Grease Haulers and Recyclers*), consists of removing the entire volume (liquids and solids) from the grease interceptor and properly disposing or recycling the material in accordance with all Federal, State, and/or local regulations. When performed properly and at the appropriate frequency, grease interceptor and trap maintenance can greatly reduce the discharge of fats, oil, and grease (FOG) into the wastewater collection system.

The required maintenance frequency for grease interceptors and traps depends greatly on the amount of FOG a facility generates as well as any best management practices (BMPs) that the establishment implements to reduce the FOG discharged into its sanitary sewer system. In many cases, an establishment that implements BMPs will realize financial benefit through a reduction in the required grease interceptor and trap maintenance frequency. Refer to Prohibitions Relating to Discharge of Fats, Oil, and Grease (pg.7) for examples of BMPs that FOG generating establishments should implement.

WARNING! - Do not use hot water, acids, caustics, solvents, or emulsifying agents when cleaning grease traps and interceptors.

Grease Trap Maintenance

The proper maintenance procedure for a grease trap is outlined below:

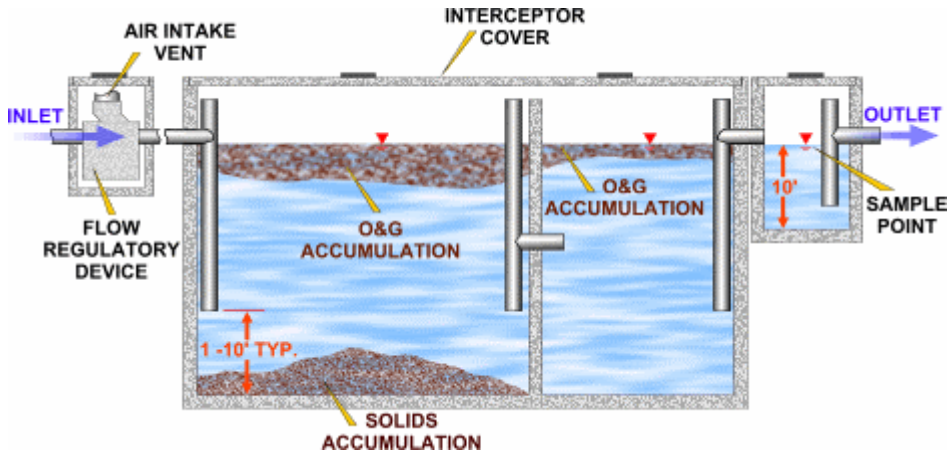


Step	Action
1.	Bail out any water in the trap or interceptor to facilitate cleaning. The water should be discharged to the sanitary sewer system.
2.	Remove baffles if possible.
3.	Dip the accumulated grease out of the interceptor and deposit in a watertight container.
4.	Scrape the sides, the lid, and the baffles with a putty knife to remove as much of the grease as possible, and deposit the grease into a watertight container.
5.	Contact a hauler or recycler for grease pick-up.
6.	Replace the baffle and the lid.
7.	Record the volume of grease removed on the <i>maintenance log</i> (Sample in Appendix D).

Grease Interceptor Maintenance

Grease interceptors, due to their size, will usually be cleaned by grease haulers or recyclers. Licensed septic haulers can also pump out grease interceptors and haul the waste to the treatment plant. Since the establishment is liable for the condition of their pretreatment devices, the establishment owners/representatives should witness all cleaning/maintenance activities to verify that the interceptor is being fully cleaned and properly maintained.

The proper maintenance procedure for a grease interceptor is outlined below:



Step	Action
1.	Contact a grease hauler or recycler for cleaning. See <i>Fats, Oil and Grease Haulers and Recyclers</i> .
2.	Ensure that all flow is stopped to the interceptor by shutting the isolation valve in the inlet piping to the interceptor.
3.	Remove the lid and bail out any water in the trap or interceptor to facilitate cleaning. The water should be discharged to the sanitary sewer system.
4.	Remove baffles if possible.
5.	Dip the accumulated grease out of the interceptor and deposit in a watertight container.
6.	Pump out the settled solids and then the remaining liquids.
7.	Scrape the sides, the lid, and the baffles with a putty knife to remove as much of the grease as possible, and deposit the grease into a watertight container.
8.	Replace the baffle and the lid.
9.	Record the volume of grease removed on the maintenance log (see Appendix D).

Suggested Grease Trap and Interceptor Inspection and Cleaning Frequencies

Unit	Suggested Inspection Frequency	Suggested Cleaning Frequency
Exterior underground grease interceptors	Visual Inspection: Weekly Kitchen managers (or delegates) should visually inspect the unit (without opening) at least weekly to ensure that it is not surcharging. Internal inspection: During each cleaning Cleaning personnel should inspect the interior of each grease interceptor to identify any cracks, broken pipes, or other problems.	<i>Monthly to Semiannual</i> Grease should not be allowed to accumulate to more than 50% of the grease interceptor's capacity. Cleaning frequency depends on loading.
Interior, under-the-sink grease traps (larger units that require vacuum truck cleaning)	Visual Inspection: Weekly Kitchen managers (or delegates) should visually inspect unit (without opening) at least weekly to ensure that it is not surcharging. Internal inspections: During each cleaning Cleaning personnel should inspect the interior of each grease interceptor to identify any cracks, broken pipes, or other problems.	<i>2 weeks to 6 times/year</i> Grease should not be allowed to accumulate to more than 50% of the grease trap's capacity. Capacity varies. Cleaning frequencies depends on loading. Given the small capacity of these units, the frequency should not be longer than every 2 months.
Under-sink grease trap or automatic grease removal unit	Observe grease and solids depth: Daily Kitchen staff must inspect units at least daily to ensure proper operation. Internal inspections: Once per year Plumbing or grease-trap cleaning personnel should internally inspect units to identify any problems.	<i>Daily</i> Grease and solids in under-sink traps should be removed at least once per day. If grease trap appears to be more than 50% full of grease at end of the day, it should be cleaned twice per day or replaced by a larger unit. Grease-removal systems will need the grease container emptied once or twice per day.
Solid strainer or interceptor	Observe Solids Depth: After each meal Kitchen staff should inspect unit to ensure proper operation.	<i>After each meal</i> Solids should be removed and put into the trash can when needed so flow through the strainer is not affected. Remove solids after each meal or once per day.

***Best Management Practices for Wastewater
Pretreatment Coordinators***

Prevent Blockages in the Sanitary Sewer System			
BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
Explain to management how to train kitchen staff and other employees about how they can help ensure BMPs are implemented.	People are more willing to support an effort if they understand the basis for it.	All of the subsequent benefits of BMPs will have a better chance of being implemented.	Talk to the establishment manager about the training program that he/she has implemented. Put in writing & post in appropriate language.
Post "No Grease" signs above sinks and on the front of dishwashers.	Signs serve as a constant reminder for staff working in kitchens.	These reminders will help minimize grease discharge to the traps and interceptors and reduce the cost of cleaning and disposal.	Check appropriate locations of "No Grease" signs.
<p>Use water temperatures less than 140° F in all sinks, especially the pre-rinse sink before the mechanical dishwasher.</p> <p>A mechanical dishwasher requires a minimum temperature of 160° F, but the Uniform Plumbing Code (UPC) prohibits discharging the dishwasher to grease traps.</p>	Temperatures in excess of 140° F will dissolve grease, but the grease can re-congeal or solidify in the sanitary sewer collection system as the water cools.	The food service establishment will reduce its costs for the energy – gas or electric – for heating the water.	<p>Check boiler or hot water heater discharge temperature.</p> <p>Measure the temperature of the hot water being discharged from the closest sink.</p>

BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
Use a three-sink dishwashing system, which includes sinks for washing, rinsing, and sanitizing in a 50-100 ppm bleach solution. Water temperatures are less than 140° F. (See above)	<p>The three-sink system uses water temperatures less than 140° F where a mechanical dishwasher requires a minimum temperature of 160° F. (See above)</p> <p>Note: The Uniform Plumbing Code (UPC) prohibits the discharge of dishwasher water to grease traps.</p>	The food service establishment will reduce its costs for the energy - gas or electric - for heating the water for the mechanical dishwasher and for operating the dishwasher.	Measure temperature of the hot water at the three-sink system.
Recycle waste cooking oil.	There are many waste oil recyclers throughout new England. This is a cost recovery opportunity. See Haulers and Recyclers .	The food service establishment will be paid for the waste material and will reduce the amount of garbage it must pay to have hauled away.	<p>Obtain name of recycler used.</p> <p>Review recycling records.</p> <p>Confirm records with recycler.</p>
"Dry wipe" pots, pans, and dishware prior to dishwashing.	The grease and food that remains in pots, pans, and dishware will likely go to the landfill. By "dry wiping" and disposing in garbage receptacles, the material will not be sent to the grease traps and interceptors.	This will reduce the amount of material going to grease traps and interceptors, which will require less frequent cleaning, reducing maintenance costs.	Observe dishwashing practices.
Dispose of food waste by recycling and/or solid waste removal.	Some recyclers will take food waste for animal feed. In the absence of such recyclers, the food waste can be disposed as solid waste in landfills by solid waste haulers.	<p>Recycling of food wastes will reduce the cost of solid waste disposal.</p> <p>Solid waste disposal of food waste will reduce the frequency and cost of grease trap and interceptor cleaning.</p>	<p>Inspect grease traps and interceptors for food waste accumulation.</p> <p>Confirm the recycler or solid waste removal company with the establishment manager.</p>

Properly Maintain Grease Traps and Interceptors to Prevent Introduction into the Sanitary Sewer System

BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
<p>Witness all grease trap or interceptor cleaning/maintenance activities to ensure the device is properly operating.</p>	<p>Grease trap/interceptor pumpers may take shortcuts. If the establishment manager inspects the cleaning operation and ensures it is consistent with the procedures in the section on <i>Grease Trap and Interceptor Maintenance</i> they are more assured of getting full value for their money.</p>	<p>The establishment will ensure it is getting value for the cost of cleaning the grease trap or interceptor. Otherwise the establishment may be paying for cleaning more often than necessary.</p>	<p>Confirm that establishment managers are witnessing all grease trap or interceptor cleaning/maintenance activities.</p>
<p>Clean undersink grease traps weekly.</p> <p>If grease traps are more than 50% full when cleaned weekly, the cleaning frequency needs to be increased.</p>	<p>Undersink grease traps have less volume than grease interceptors.</p> <p>Weekly cleaning of undersink grease traps by the establishment's own maintenance staff will reduce the cost of cleaning the grease interceptor.</p> <p>If the establishment does not have a grease interceptor, the undersink grease trap is the only means of preventing grease from entering the sanitary sewer system. If the grease trap is not providing adequate protection, the local sewer agency may require installation of a grease interceptor or a self cleaning trap.</p>	<p>This will extend the length of the cleaning cycle for grease interceptors that the establishment maintains.</p>	<p>Visually inspect the contents of the undersink grease trap.</p> <p>Inspect cleaning records.</p>

BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
<p>Clean grease interceptors routinely.</p> <p>Set up a schedule based upon experience.</p>	<p>Grease interceptors must be cleaned routinely to ensure that grease accumulation does not cause the interceptor to operate poorly.</p> <p>The cleaning frequency is a function of the type of establishment, the size of the interceptor, and the volume of flow discharged by the establishment.</p>	<p>Routine cleaning will prevent plugging of the sewer line between the food service establishment and the sanitary sewer system. If the line plugs, the sewer line may back up into the establishment, and the business will need to hire someone to unplug it.</p>	<p>Interceptor should have no more than 1/3 the depth as grease, and,</p> <p>Interceptor should have no more than 1/4 the depth as sediment, and</p> <p>No more than 25% of the depth should be a combination of grease (top) and sediment (bottom).</p>
<p>Keep a <i>maintenance log</i>.</p>	<p>The maintenance log serves as a record of the frequency and volume of cleaning the interceptor. It is required by the pretreatment program to ensure that grease trap/interceptor maintenance is performed on a regular basis.</p>	<p>The maintenance log serves as a record of cleaning frequency and can help the establishment manager optimize cleaning frequency to reduce cost.</p>	<p>Inspect maintenance log.</p> <p>Provide the establishment with a sample maintenance log if it does not have one.</p> <p>Confirm the maintenance log with the grease hauler identified.</p>

Prevent Fats, Oil, and Grease From Entering Creeks and Streams Through the Storm Drain System and causing a NPDES Violation

BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
<p>Cover outdoor grease and oil storage containers.</p> <p>Some local jurisdictions will have BMPs in place for stormwater also.</p>	<p>Uncovered grease and oil storage containers can collect rainwater. Since grease and oil float, the rainwater can cause an overflow onto the ground. Such an overflow will eventually reach the stormwater system and nearby streams.</p>	<p>The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream.</p> <p>Discharge of grease and oil to the storm drain might also result in legal penalties or fines.</p>	<p>Observe storage area for signs of oil and grease.</p> <p>Inspect containers for covers.</p> <p>Remove covers to ensure containers have not overflowed and do not have excess water.</p>
<p>Locate grease dumpsters and storage containers away from storm drain catch basins.</p>	<p>The farther away from the catch basin, the more time someone has to clean up spills or drainage prior to entering the storm drain system.</p> <p>Be aware of oil and grease dripped on the ground while carrying waste to the dumpster, as well as oil and grease that may "ooze" from the dumpster.</p>	<p>The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream.</p> <p>Discharge of grease and oil to the storm drain might also result in legal penalties or fines.</p>	<p>Observe storage area for signs of oil and grease.</p> <p>Inspect the closest catch basin for signs of accumulated grease and oil.</p>

BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
<p>Use absorbent pads or other material in the storm drain catch basins if grease dumpsters and containers must be located nearby.</p> <p>Do not use free flowing absorbent materials such as "kitty litter" or sawdust.</p>	<p>Absorbent pads and other materials can serve as an effective barrier to grease and oil entering the storm drain system.</p>	<p>The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream.</p> <p>Discharge of grease and oil to the storm drain might also result in legal penalties or fines.</p>	<p>Check the nearest catch basin and drainage paths for signs of grease and oil.</p> <p>Require absorbent pads if the basin is within 20 feet of grease dumpsters or containers, or if there are signs of grease in the catch basin at any distance.</p> <p>Do not permit the use of free flowing absorbent material such as "kitty litter."</p>
<p>Use absorbent pads or other material to clean up spilled material around outdoor equipment, containers or dumpsters.</p> <p>Do not use free flowing absorbent materials such as "kitty litter" or sawdust that can be discharges to the storm drain system.</p>	<p>Absorbent pads or materials can help clean up grease and oil that is spilled on the ground and prevent it from flowing to the storm drain system.</p>	<p>The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream.</p> <p>Discharge of grease and oil to the storm drain might also result in legal penalties or fines.</p>	<p>If grease and oil are observed on the ground in the storage area, recommend the use of absorbents to minimize movement of the grease and oil.</p> <p>Do not permit the use of free flowing absorbent material such as "kitty litter."</p>
<p>Routinely clean kitchen exhaust system filters.</p>	<p>If grease and oil escape through the kitchen exhaust system, it can accumulate on the roof or walls of the establishment and eventually enter the storm drain system when it rains.</p>	<p>The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream.</p> <p>Discharge of grease and oil to the storm drain might also result in legal penalties or fines.</p>	<p>Inspect roof (if safely accessible) for signs of oil and grease.</p> <p>Require a maintenance schedule and records for cleaning exhaust filters. Cleaning is usually by washing, which will discharge the grease to the interceptor where it can be controlled.</p>

Appendix A
Listed Grease Trap Companies Doing Business in NH

Action-King Grease Trap Service Lawrence, Massachusetts Tel: (978) 687-2688	All-Clear Grease Traps 43 Summer St. Somerville, Massachusetts Tel: (617) 623-3223
Baker T Restaurant Equip. & Co. 174 Neponst Ave. Dorchester, Massachusetts Tel: (617) 287-1717	Baker Commodities Inc. (Corenco) Billerica Division North Billerica, Massachusetts Ken Fournier, Sales Rep Tel: (978) 454-8811/Ext. 215)
B H Cameron Septic Services LLC 238 Paulson Rd Farmington, NH 03835 (603) 755-2110	Barrington Septic 188 Wakefield Rd Union, NH 03887 (800) 462-6272
DJ's Septic Pumping Services 67 Middle Road Wolfeboro, NH 03894 (603) 569-5286	Drain Masters Inc 2 Wagner Way Hudson NH (866) 953-5874
Gosse Septic Service 311 Shackford Corner Road Center Barnstead, NH 03225 (603) 269-3441	Lapierre's Septic Service 394 Chestnut Hill Road Farmington, NH 03853 (603)755-2017
Rooter-Man Sewer & Drain Service Boston, Massachusetts Central Dispatch Center Tel: (617) 262-7227	Septic Manager 841 Sullivan Center Road Sullivan, NH 03445 (603) 847-9158
Service Pumping & Drain Co., Inc 5 Hallberg Park North Reading MA 01864 Tel: (978) 267-0217	Suburban Contract Cleaning, Inc 55 Messina Drive Braintree MA Tel: (781) 356-4400
Stewart Septic Service, Inc. 20 S. Mill St. Bradford, MA 01835 Tel: (978) 372-7471	Venturi Aeration of Massachusetts 5 Foundry St. Lowell, Massachusetts John Salonich, General Manager Tel: 1-800-439-2610
White's Septic Service 164 Mountain Rd. Dalton, NH 03598 (603) 837-2728	

Appendix B

Sample Compliance Inspection Checklist

Establishment: _____
 Address: _____
 Contact Name: _____
 Phone: _____

Date: _____
 Time Inspection Started: _____
 Time Inspection Completed: _____
 Inspector: _____

Number	Item Description	Field Data (where appropriate)	Compliance Status
1.	The establishment has implemented a training program to ensure that the BMPs are followed.		
2.	"No Grease" signs are posted in appropriate locations.		
3.	The establishment recycles waste cooking oil and can provide records of this.		
4.	Water temperatures at all sinks, especially the pre-rinse sink before the mechanical dishwasher or the sinks in the three-sink system are less than 140° F. Measure and record temperature.		
5.	The establishment "dry wipes" pots, pans, and dishware prior to rinsing and washing.		
6.	Food waste is disposed of by recycling or solid waste removal and is not discharged to the grease traps or interceptors.		
7.	Grease trap(s) is cleaned regularly. Note and record the frequency of cleaning.		
8.	Grease trap cleaning frequency is documented on a maintenance log (obtain a copy of the document). Sample form in (Appendix D).		
9.	Grease interceptor does not contain greater than 1/3 the depth in grease accumulation. Estimate and record amount of grease in interceptor.		
10.	Grease interceptor does not contain greater than 1/4		

the depth in sediment accumulation. Estimate and record amount of sediment in interceptor if possible.

11. Grease interceptor is cleaned and maintained regularly. Note and record frequency of cleaning.
12. Grease interceptor cleaning and maintenance frequency is documented on a maintenance log (obtain a copy of the document). Sample form in (Appendix D).
13. Outdoor grease and oil storage containers are covered and do not show signs of overflowing.
14. Grease and oil storage containers are protected from discharge to storm drains.
15. Absorbent pads or other materials (not free flowing material such as cat litter) are used to clean up any spills or leakages that could reach the storm drain.
16. Storm drain catch basins show no signs of grease or oil.
17. The roof shows no signs of grease and oil from the exhaust system.
18. Exhaust system filters are cleaned regularly, which is documented by cleaning records. Note and record frequency of cleaning.

NOTES:

¹An entry should be made for each item using the following codes:

- "C" – Compliance with the item
- "V" – Violation of the item (provide explanation in the notes)
- "NA" – Not applicable (provide explanation in the notes)
- "NC" – Not checked (provide explanation in the notes)

Appendix C
Sample Installation Checklist

Establishment:_____

Address:_____

Contact Name:_____

Phone:_____

Date:_____

Time Inspection Started:_____

Time Inspection Completed:_____

Inspector:_____

Number	Item Description	Compliance Status ¹
1.	Each grease trap serves not more than four single compartment sinks of the same depth. Grease trap is sized based upon the number of fixtures discharging to it.	
2.	Grease traps have a water seal of not less than two inches in depth or the diameter of its outlet, whichever is greater.	
3.	No food waste disposal unit or dishwasher is connected to or discharges into any grease trap.	
4.	Waste from toilets and urinals do not discharge to the grease interceptor.	
5.	Waste in excess of 140° F is not discharged to any grease trap. (Dishwasher with a min. temperature of 160° F is not discharged to any grease trap.)	
6.	The vertical distance between the fixture outlets and grease trap weirs is as short as practical.	
7.	Grease interceptor is as close as practical to the fixtures served.	
8.	Each fixture connected to a grease trap is provided with an approved type flow control or restricting device installed in a readily accessible and visible location. Devices shall be designed so that the flow through the device or devices at no time exceeds the rated capacity of the grease trap or interceptor.	
9.	Each fixture discharging into a grease trap or interceptor is individually trapped and vented in an approved manner.	
10.	Each grease trap and interceptor is properly vented to allow air circulation throughout the entire drain system.	
11.	No water jacketed grease trap or interceptor is installed.	
12.	Grease interceptor is easily accessible for inspection and cleaning and access does not require the use of ladders or the removal of bulky equipment.	
13.	There is a minimum of one access point into each compartment of the interceptor and no access points are greater than 10 feet apart. Each access opening is leak resistant and cannot slide	

rotate, or flip.

14. Location of grease interceptor is shown on approved building plans. Drawings of interceptor are complete and show all dimensions, capacities, reinforcing and structural design calculations.
15. Grease interceptor is not installed in any part of a building where food is handled. Location shall meet the approval of the Administrative Authority.
16. Grease interceptor serves a single business establishment.
17. Grease interceptor has a minimum of two compartments and 3-inch diameter fittings designed for grease retention. The compartments shall be separated by partitions or baffles that extend at least 6 inches above the water level. The inlet compartment shall be 2/3 of the total interceptor capacity and shall have a minimum liquid volume of 333 gallons. The length of the inlet compartment shall be longer than the inside width of the interceptor.
18. The inlet and outlet fittings shall be a baffle tee (or similar flow device) that extends at least 4 inches above the water level to within 12 inches of the bottom of the interceptor. The outlet tee out of a sample box shall extend at least 6 inches below the water surface. Flow between the separate compartments is through a baffle tee or bend that extends down to within 12 inches of the bottom of the interceptor.
19. The liquid depth shall be greater than or equal to 2'-6" and less than 6'-0".
20. There shall be a minimum of 9 inches of open vent space above the water level to the top of the interceptor. The airspace has a minimum capacity equal to 12-1/2% of the grease interceptors' liquid volume.
21. The grease interceptor has at least one square foot of surface area for every 45 gallons of liquid capacity.
22. All waste enters the interceptor through the inlet pipe.
23. Grease interceptor cover is gastight and has a minimum opening of 20 inches in diameter.

24. Grease interceptors located in areas of pedestrian or vehicle travel are adequately designed to support the imposed loads. Review of structural calculations may be required to verify adequacy.
25. Baffles are not installed in grease interceptor.
26. A sample box is provided on the outlet side of the grease interceptor. This is recommended and may be required by the UPC so that the Administrative Authority can periodically sample the effluent quality.
27. Grease interceptor is permanently and legibly marked with the manufacturer's name of trademark, model number, UPC certification mark and registration (if product is listed by the International Association of Plumbing and Mechanical Officials), and any other markings required by law.

NOTES:

¹An entry should be made for each item using the following codes:

- "C" – Compliance with the item
- "V" – Violation of the item (provide explanation in the notes)
- "NA" – Not applicable (provide explanation in the notes)
- "NC" – Not checked (provide explanation in the notes)

Appendix D
Grease Interceptor Cleaning Record
Verification Form

Facility Name: _____

Address: _____

Service Company used: _____

DATE	CLEANED BY	WITNESSED BY	GALLONS PUMPED	GREASE DISPOSAL SITE	REMARKS

Appendix E

Model Sewer Use Ordinance for Grease

Grease, oil, and sand interceptors shall be provided at the owner's expense when, in the judgment of the [Superintendent], these devices are necessary for the preliminary treatment of wastewater containing excessive amounts of grease and oil, or sand; except that such interceptors shall not be required for residential users. All interception units shall be of a type and capacity approved by the [Superintendent] and shall be so located to be easily accessible for cleaning and inspection. Such interceptors shall be inspected, cleaned, and repaired regularly, as needed, by the user at their expense. The owner shall be responsible for the proper removal and disposal by appropriate means of the captured materials and shall maintain records of the dates and means of disposal, which shall be subject to periodic review by the [Superintendent]. Any removal and hauling of the collected materials shall be performed by currently licensed waste disposal firms.